

CLAIMS:

What is claimed is:

- Sub A1*
1. An automotive steering system comprising:
 - a shaft linked to a set of road wheels;
 - a sensor connected to the shaft for sensing torque applied to the shaft and operative to provide as output a signal indicative of the applied torque;
 - 5 a controller in signal communication with the sensor and operative thereby to accept as input from the sensor the signal indicative of the torque applied to the shaft; and
 - a motor coupled to the shaft and in signal communication with the controller and operative thereby to accept as input from the controller a command to apply torque to the shaft.

2. The automotive steering system as set forth in Claim 1 wherein the shaft includes
 - a first section;
 - 5 a second section linked to the set of road wheels; and
 - a third section joining the first and second sections.

- Sub A2*
3. The automotive steering system as set forth in Claim 2 wherein the sensor comprises at least one piezosensitive element coupled to the shaft.

4. The automotive steering system as set forth in Claim 3 wherein the at least one piezosensitive element is part of an electric circuit.

5. The automotive steering system as set forth in Claim 3 wherein the at least one piezosensitive element is connected to an amplifier operative thereby to provide as output the signal indicative of the torque applied to the shaft.

6. The automotive steering system as set forth in Claim 4 wherein the at least one piezosensitive element includes a piezoresistor.

7. The automotive steering system as set forth in Claim 4 wherein the electric circuit comprises a bridge circuit.

8. The automotive steering system as set forth in Claim 7 wherein the bridge circuit is a wheatstone bridge.

9. The automotive steering system as set forth in Claim 1 wherein the shaft includes

a hub connected to the shaft; and
a steering wheel connected to the hub.

10. The automotive steering system as set forth in Claim 9 wherein the sensor comprises at least one piezosensitive element coupled to the hub.

11. The automotive steering system as set forth in Claim 10 wherein the at least one piezosensitive element is part of an electric circuit.

12. The automotive steering system as set forth in Claim 10 wherein the at least one piezosensitive element is connected to an amplifier operative thereby to provide as output the signal indicative of the torque applied to the hub.

13. The automotive steering system as set forth in Claim 11 wherein the at least one piezosensitive element includes a piezoresistor.

14. The automotive steering system as set forth in Claim 11 wherein the electric circuit comprises a bridge circuit.

15. The automotive steering system as set forth in Claim 14 wherein the bridge circuit is a wheatstone bridge.

16. An automotive torque sensor for sensing torque applied to a shaft, the sensor comprising:
at least one piezosensitive element coupled to the shaft; and
an amplifier in signal communication with the at least one piezosensitive element and operative thereby to provide as output a signal indicative of the applied torque applied to the shaft.

17. The automotive torque sensor as set forth in Claim 16 wherein the at least one piezosensitive element comprises an electric bridge circuit.

18. The automotive steering system as set forth in Claim 17 wherein the bridge circuit is a wheatstone bridge.

19. The automotive steering system as set forth in Claim 1
wherein the shaft includes

an exterior surface;
an interior surface; and
5 wherein the sensor is positioned on the interior surface of the
shaft.

20. The automotive steering system as set forth in Claim 19
wherein the sensor comprises at least one piezosensitive element coupled to the
shaft.

21. The automotive steering system as set forth in Claim 20
wherein the at least one piezosensitive element is part of an electric circuit.

22. The automotive steering system as set forth in Claim 20
wherein the at least one piezosensitive element is connected to an
amplifier operative thereby to provide as output the signal indicative of
the torque applied to the shaft.

23. The automotive steering system as set forth in Claim 21
wherein the at least one piezosensitive element includes a piezoresistor.

24. The automotive steering system as set forth in Claim 21
wherein the electric circuit comprises a bridge circuit.

25. The automotive steering system as set forth in Claim 24
wherein the bridge circuit is a wheatstone bridge.

26. The automotive steering system as set forth in Claim 1 wherein the shaft includes a slot having a central section positioned between first and second end sections for receiving the sensor.

27. The automotive steering system as set forth in Claim 26 wherein the sensor comprises at least one piezosensitive element coupled to the hub.

28. The automotive steering system as set forth in Claim 27 wherein the at least one piezosensitive element is part of an electric circuit.

29. The automotive steering system as set forth in Claim 27 wherein the at least one piezosensitive element is connected to an amplifier operative thereby to provide as output the signal indicative of the torque applied to the hub.

30. The automotive steering system as set forth in Claim 28 wherein the at least one piezosensitive element includes a piezoresistor.

31. The automotive steering system as set forth in Claim 28 wherein the electric circuit comprises a bridge circuit.

32. The automotive steering system as set forth in Claim 31 wherein the bridge circuit is a wheatstone bridge.